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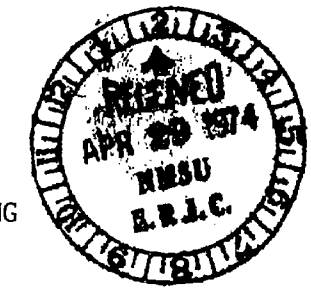
ABSTRACT

The study attempted to determine whether any significant differences of educational achievement, as measured by a standard test of academic performance, existed between groups and subgroups within 2 high school levels of varied ethnicity and socioeconomic status. The study was conducted at Hot Springs High School, Truth or Consequences (New Mexico). All 9th and 11th grade students enrolled for 1970-71 were involved. Students with Spanish surnames were classified as Mexican Americans; all others as Anglos. Three hypotheses concerning the effects of ethnicity, socioeconomic status, and interaction between ethnicity and socioeconomic status were formulated and tested by analysis of variance. The only significant difference found was that for ethnicity at the 11th grade level. Lack of significant difference for socioeconomic status was attributed to the cohesiveness of the sample grades, smallness of the county population, and absence of racial or social barriers in the community setting. Recommendations included replication with expansion to cover one or more school districts, including both urban and rural areas; assessment of educational goals and procedures and immediate revision of curricula to motivate and retain the low socioeconomic student, especially the Mexican American; and efforts to identify and modify, if practicable, such socioeconomic factors as self-concept. (Author/KM)



EFFECTS OF ETHNICITY AND SOCIOECONOMIC STATUS ON LEARNING ACHIEVEMENT OF NINTH- AND ELEVENTH-GRADE STUDENTS

BY

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A Thesis submitted to the Graduate School

in partial fulfillment of the requirements

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ABSTRACT

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This study attempted to determine whether any significant differences of educational achievement, as measured by a standard test of academic performance, existed between groups and subgroups within two high school levels of varied ethnicity and socioeconomic status. The ultimate objective was to identify any factors that

could possibly be modified by revision of existing school programs so that socioeconomic level, and thus educational achievement, could be improved.

The study was conducted at Hot Springs High School, Truth or Consequences School District, Sierra County, New Mexico. All ninth- and eleventh-grade students (78 and 79, respectively) enrolled full-time for 1970-71 were involved. Students with Spanish surnames were classified as Mexican Americans, and all others were classified as Anglo Americans. Socioeconomic status (high or low) was determined through use of the Hollingshead Two-Factor Index of Social Position. The Iowa Test of Educational Development (ITED) was used to measure educational performance.

Three hypotheses concerning the effects of ethnicity, socioeconomic status, and interactions between ethnicity and socioeconomic status were formulated and tested by analysis of variance. The only significant difference found was that for ethnicity at the eleventh-grade level (F ratio significant at the .05 level). Calculation of means for ITED scores for each ethnic/socioeconomic group within each grade revealed the following rankings: for the ninth grade, high socioeconomic Anglo Americans, low socioeconomic Anglo Americans, high socioeconomic Mexican Americans, and low socioeconomic Mexican Americans; for the eleventh grade, high socioeconomic Anglo Americans, low socioeconomic Anglo Americans, low socioeconomic Mexican Americans, and high socioeconomic Mexican Americans. Achievement for high Anglo Americans dropped slightly from grade

to grade; that for low Anglo Americans remained the same; and that for both Mexican-American groups dropped from grade to grade.

Lack of significant differences for socioeconomic status was attributed to the cohesiveness of the sample grades, smallness of the county population from which students were drawn, and absence of racial or social barriers in the community setting. Available data not tabled disclosed that 35 of the eleventh-graders eventually attended college; 10 of these were Mexican Americans. Utilization of federal, state, and community loans and scholarships indicated that students had anticipated and sought financial aid.

Recommendations included replication with expansion to cover one or more school districts, including both urban and rural areas with more distinct racial and socioeconomic community settings; assessment of educational goals and procedures and immediate revision of curricula to motivate and retain the low socioeconomic student, especially the Mexican American; efforts to identify and modify, if practicable, such socioeconomic factors as self-concept; and follow-up studies to ascertain whether post-graduation socioeconomic levels were elevated and the factors responsible.

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Chapter 1

INTRODUCTION

According to a survey conducted by the U.S. Department of Health, Education and Welfare of racial and ethnic enrollment in American public schools for the academic year 1970-71, Spanish-surnamed students comprised 2.3 million, the second largest minority group in the country (Reader's Digest Almanac and Yearbook, 1972, p. 319). This group included Mexicans, Mexican Americans, Puerto Ricans, and those of other Spanish-speaking origin. Due to a similarity of culture and language, despite point of origin, Spanish-speaking and/or Spanish-surnamed persons are usually categorized as Mexican Americans.

In the 1960's it was widely recognized that Mexican-American children presented the most acute educational problem in the Southwest (National Education Association, 1966) and that an educational gap existed between Mexican-American and Anglo-American students, especially at the high school level (Coleman, 1966; Grebler, 1967). Coleman (1966) found that the Mexican American performed consistently lower than the Anglo American in both verbal and nonverbal tests and that the difference was greater at grade twelve than at the first grade, thus giving an early foundation for Grebler's (1967) theory that the educational gap increased by grade levels.

In addition to the effect of ethnicity on academic performance, differences in socioeconomic status have long been known to contribute to variability in achievement. Early studies (Friedhoff, 1955; Knief & Stroud, 1959; Lavin, 1965; Noll, 1960) all recognized that socioeconomic status is directly related to academic performance. According to Lavin (1965), socioeconomic status is significant in the study of achievement "because it summarizes systematic variations in attitudes, motivations, and value systems that are related to such performance [p. 128]." Students from different socioeconomic backgrounds face different kinds of life situations and may develop different attitudes and values toward curricular offerings. Related socioeconomic factors include not only parental occupation and education, but also group, parental, and peer aspirations, expectations, attitudes, and self-concept, as well as subcultural and regional values.

In the past decade, many studies have been made concerning educational achievement by minority groups. Some of this research was performed chiefly to assess the effects of ethnicity on achievement; some was performed to determine the effects of socioeconomic status; and many have been carried out in consideration of both ethnicity and socioeconomic status. In many cases, it would seem almost impossible to separate the effects of ethnicity and socioeconomic status because they are so closely related.

In New Mexico, the educational achievement of Mexican-American students has concerned educators for many years. Much time and

money have been expended by federal and state agencies in developing new programs or curricula to improve Mexican-American educational achievement. These developments have been based on the results of such studies as that carried out by the New Mexico State Department of Education (1963) on elementary school children with regard for ethnicity and socioeconomic status. It was found that Anglo Americans ranked first and Mexican Americans second, a finding substantiated by Loar (1964).

Need for the Study

A review of the literature revealed that studies of educational achievement appear to have been based chiefly on comparisons between main ethnic and/or socioeconomic groups. It would appear that other possible interactions between subgroups and within groups have been neglected, such as high socioeconomic Anglo Americans versus low socioeconomic Mexican Americans or high socioeconomic Mexican Americans versus low socioeconomic Mexican Americans. Obviously, research should address all combinations of groups and subgroups in order to achieve valid results.

This study was therefore devised to explore educational achievement of high school students with regard for both ethnicity and socioeconomic status and interactions of ethnicity and socioeconomic status. Two high school levels were chosen, the ninth and eleventh grades, on the grounds of previous findings that the educational gap between Anglo Americans and Mexican Americans is especially perceptible at high school level (Grebler, 1967). According to

Coleman (1966) and Grebler (1967), the educational gap increases by grade levels. Therefore, it was reasoned, the omission of one level (the tenth grade) should emphasize educational gap and any significant effects appearing between the ninth and eleventh grades.

It was hoped that information provided by this study would aid in curriculum revision for improvement of educational achievement that would result in raising socioeconomic status. This theory was based, at least in part, upon Wilson's (1968) evaluation of the influence of educational curricula on Mexican-American academic progress. Wilson found that immediate curriculum and instructional changes appeared to ameliorate the conditions of poverty and its cultural restrictions. Academic failure is more devastating for the lower socioeconomic student than for the middle- or upper-class student. The middle-class student will attempt to shore up his reserves and resources and focus more sharply on trying to solve the cause of failure, whereas the lower-class youngster, having behind him a repeated series of failures, has no reserves to draw on and consequently is more apt to abandon the problem completely by dropping out of school. Other factors appear to affect retention. Extracurricular activities, when engaged in by the student of low socioeconomic status, give him the feeling that he is contributing to the school; thus he is less apt to abandon his education. However, certain experiences seem to affect him unfavorably. The lower-class student often meets with situations which require

interactions with ideas and things normally unknown to him and tends to react negatively or unfavorably, thus giving him another failure. For example, according to Wilson (1968), the Mexican American, due to his background and cultural characteristics, is more accustomed to family participation in activities than the Anglo American, who is more familiar with individual reaction and organization. In a testing situation which requires individual participation, the Mexican American may be lost, but he will find that individual participation is a practice in Anglo-American culture.

It is obvious that if the Mexican American of lower socioeconomic status can be retained in school, his education will be enhanced and he will have a better chance of moving upward on the socioeconomic scale.

To retain the lower-class Mexican American in school, he must be exposed to learning situations in which he will experience success and satisfaction. If, as Wilson (1968) suggested, immediate changes in educational programs tend to alleviate unfavorable social and economic conditions, what changes are necessary should be determined. It was hoped that this study would indicate these changes by determination of ethnic and socioeconomic effects. With the study's completion, a more comprehensive study could be made with a larger school population in other areas of New Mexico to confirm or refute results.

Statement of the Problem

The problem was to determine whether any significant differences of educational achievement, as determined by a standard test of academic performance, existed between groups and subgroups of varied ethnicity and socioeconomic status. The Iowa Test of Educational Development (ITED) was the instrument selected to measure academic performance. The sample considered consisted of ninth- and eleventh-grade students of Mexican-American and Anglo-American ethnicity and two levels, high and low, of socioeconomic status. The setting was Hot Springs High School, Truth or Consequences School District, Sierra County, New Mexico.

Null Hypotheses

The following null hypotheses were formulated and tested on the ninth and eleventh grades:

1. There will be no significant difference in educational achievement, as measured by the ITED, between Anglo Americans and Mexican Americans within each grade level.

2. There will be no significant difference in educational achievement, as measured by the ITED, between high socioeconomic and low socioeconomic students within each grade level.

3. There will be no significant difference in educational achievement, as measured by the ITED, within each grade level by ethnicity and socioeconomic status for:
   a. High socioeconomic Anglo Americans versus high socioeconomic Mexican Americans;
   b. High socioeconomic Anglo Americans versus low socioeconomic Anglo Americans;
   c. High socioeconomic Mexican Americans versus low socioeconomic Mexican Americans;

d. Low socioeconomic Anglo Americans versus low socioeconomic Mexican Americans;
e. Low socioeconomic Anglo Americans versus high socioeconomic Mexican Americans; and
f. High socioeconomic Anglo Americans versus low socioeconomic Mexican Americans.

Assumptions

It was assumed that:

1. The Iowa Test of Educational Development is a reliable test instrument.
2. Standardized test procedures would be closely observed in administration of the ITED.
3. Scores from the ITED would be accurately obtained.
4. The Hollingshead Two-Factor Index of Social Position is a valid and reliable instrument for determining socioeconomic status.

Limitations

1. The study was limited to 157 subjects, members of the ninth and eleventh grades of Hot Springs High School, Truth or Consequences School District, Sierra County, New Mexico, for the academic year 1970-71.
2. Groups were chosen on the basis of ethnicity and socioeconomic status, with ethnic groups being limited to Anglo Americans and Mexican Americans and socioeconomic groups being limited to high and low.

4. Study findings pertain only to these particular groups in this particular high school in semi-rural Sierra County, New Mexico, and should not be generalized to other groups or schools except to provide guidelines in carrying out replicate studies.

Definitions

Anglo American. Refers to the numerically dominant, English-speaking population whose culture, despite minor regional variations, is that of the United States as a whole. So used, the term designates a residual category that includes anyone not identifiable as Mexican American, Negro, or Native American in the Southwest (personal communication, DeBlassie, 1971[1]). However, in this study the term was used to designate any student not identified as Mexican American.

Hollingshead Two-Factor Index of Social Position. A measure designed to determine the socioeconomic status of a student according to the educational, occupational status of the head of the household (Appendix A).

Iowa Test of Educational Development (ITED). A battery of nine objective tests designed to provide a comprehensive and dependable description of the general educational development of the high school student (Appendix B).

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[1]Dr. R. R. DeBlassie, Head of Department and Professor of Educational Psychology, New Mexico State University.

Mexican American. Refers to a member of the population possessing a Spanish or Mexican cultural heritage and/or a Spanish surname and/or Spanish-speaking to some extent.

Organization of the Remainder of the Study

Chapter 2, the review of literature, contains two main sections, effects of ethnicity on achievement and effects of socioeconomic status on achievement. In Chapter 3, methods are outlined, with a description of the setting, the sample, instrumentation used, and procedures, followed by a section on treatment of the data. An additional section notes subsequent disposition of students. Chapter 4 contains a presentation of the results in tabular form and a discussion. Chapter 5 has a summary, conclusions, and recommendations.

Chapter 2

REVIEW OF LITERATURE

A review of the literature disclosed numerous studies on the interrelationships of ethnicity, socioeconomic status, and educational achievement. Most of these studies were empirical in nature and regionalized, i.e., pertaining to areas of the United States where various ethnic groups are proportionally large and/or socioeconomic status varies considerably. These studies were made at different educational levels from preschool (for example, Hess & Shipman, 1965) through grade 12 (Palomares, 1967). Some emphasized the effects of ethnicity and socioeconomic status on total educational achievement, while a few emphasized effects of ethnicity and/or socioeconomic status on specialized aspects of learning.

This chapter is divided into two main sections: effects of ethnicity on achievement and effects of socioeconomic status on achievement. Most studies on the effects of ethnicity on educational achievement also contained references to effects of socioeconomic status so that it was difficult to classify these studies and results. However, an effort was made to concentrate on the main variable in each study. Also, since many studies pertained to other minority groups besides Mexican Americans, some of these have been included to show the direction of effects. Emphasis was

placed on socioeconomic factors because these are the more important and the more pertinent to this study.

Ethnicity and Achievement

In general, it was found that Anglo Americans attained higher educational levels than Mexican Americans (Coleman, 1966; Grebler, 1967; Loar, 1964; Mageske, 1967; New Mexico State Department of Education, 1963; Wilson, 1968). For example, Scott (1969), in a study of two South Texas counties, found that urban and rural Mexican Americans had lower educational levels than Anglo Americans. Palomares (1967) carried out an extensive study of Mexican-American children's achievement in California schools. He used the Wechsler Intelligence Test for obtaining scores from two groups, grades four through six, and grades eight through twelve. The first group showed an average range of intelligence scores within the range of average intelligence scores nationally, but the second group showed verbal IQ's with a mean of 90.4 and performance IQ's with a mean of 98.2 The high school students fell one standard deviation below the mean on the norm. Although the students showed a gradually ascending pattern, this could mean that the population being studied was of a higher selectivity due to dropouts, but they tended to fall progressively behind the normative population as they progressed with age. This finding was in agreement with Coleman's (1966) and Grebler's (1967) theory that the educational gap between the Mexican American and Anglo American increased by grade levels.

On the other hand, some studies have reported little or no difference in achievement according to ethnicity. McQueen and Churn (1966), studying a Western community with a long history of integration, found that elementary students showed little difference in achievement when compared on a racial basis. Okada, Cohen, and Mayesha (1969) found that ethnic grouping had no effect on achievement level. Jensen (1961), Rapier (1966), and Rohwer (1966) found that the performance of varying socioeconomic classes of Negroes, Mexican Americans, and Anglo Americans did not differ markedly in laboratory learning tasks, such as selective trial and error learning and paired-associate tasks.

Socioeconomic Status and Achievement

Many studies have pointed out that there is a definite relationship between socioeconomic status in general and school achievement. General consensus was that the direct relationship between socioeconomic status and academic performance ultimately affects one's life chance for achievement. Furthermore, particular socioeconomic factors, such as self-concept, aspirations and expectations, parental and family influence, language and cultural differences, were involved in determining effects of socioeconomic status.

Curry (1962), working with sixth-graders in the Southwest and using standard achievement tests, concluded that the higher the level of socioeconomic status, the higher the level of achievement. The higher socioeconomic group made much greater gains than the

lower socioeconomic group, but the highest scoring group appeared to be independent of socioeconomic levels. Curry also found that parental occupational level correlated with a child's achievement on all subjects except arithmetic.

The general finding that high- and middle-income groups performed at higher levels than the low-income group was corroborated by Larson (1969), who disregarded ethnicity and directed his attention to socioeconomic factors in a study of rural high school youth in Washington. Okada et al. (1969) also found that difference in achievement level widened with the lower-income group as they progressed, regardless of ethnicity.

Those studies which examined both ethnicity and socioeconomic status as factors affecting academic performance continued to report that the higher the socioeconomic level, the higher the achievement level. In a comparative study of minority groups of Jewish, Negro, Chinese, and Puerto Rican students in New York City, Stodolosky and Lesser (1967) found that the middle-class students made higher achievement gains than the lower-class group. When Okada et al. (1969) did consider ethnicity in their study, they found that higher-class Negroes outranked Negroes, Puerto Ricans, and Anglo Americans of lower socioeconomic class in respect to educational achievement. In studying the effects of teacher attitudes toward pupils, Gansuender (1970) reported that students in middle-class "white" schools achieved higher than students in lower-class "white" or lower-class "black" schools. He concluded

that the difference between achievement rates was due to socio-economic status rather than teacher attitudes and that the student's socioeconomic status seemed to affect his ability to learn. However, when achievement of Southern Negroes and poor "whites," presumably on the same socioeconomic level, was examined by Holmes (1969), he concluded that their inability to achieve was about the same, due to functional illiteracy.

Parental-family influences and attitudes. In studying some of the cultural and bilingual factors apparently contributing to educational retardation, Mageske (1967) found that influential factors included family size, father's occupation, and degree of bilingualism. But he concluded that family background was more important for achievement than any other factor and that association of family background with achievement did not diminish over the years. Although not attaching such importance to the influence of family and parents, other researchers found that home environment was related to achievement (Anderson & Johnson, 1968; Dave, 1963; Forbes, 1967; Larson, 1969; Palomares, 1967; Wolf, 1965). Both Anderson and Johnson (1968) and Larson (1969) indicated that the child's educational desire to complete high school and attend college appeared to be related to parental educational aspirations for the child. The former suggested that the child himself may develop his own desire to compete and achieve in school and thus be independent of parental wishes, and the latter indicated that introduction or exposure to mass media and contact with higher

levels of living may persuade the child to proceed with his education.

Larson (1969) found that the lower-income family did not provide the necessary motivation in the form of expressed values and attitudes concerning the importance of education; nor did it provide strong sanctions to increase the probability of conformity to middle-class achievement norms and values. No role models of high educational achievement were provided for emulation. Low-income level students were less likely to report high levels of educational and occupational aspirations and expectations; they were also less likely to be interested in school and enrolled in curricula designed for students intending to attend college.

The general conclusion arrived at by Larson (1969), that the lower-income family did not show interest and concern for educational development and did not (or could not) provide the financial and moral support necessary for achievement for students who have ability and motivation, had earlier been advanced by Palomares (1967). Palomares, finding that Mexican-American students tended to fall progressively behind the normative population as they progressed in school, attributed such regression to probable home and school environment. Noting that the students being tested were of the lower socioeconomic classes, such as laborers, Palomares (1967) concluded that parental lack of knowledge concerning educational development, lack of interest, lack of finances to purchase suitable educational tools, and pressure to work to augment low family income,

were all associated with failure to achieve. However, Palomares cautioned that his conclusions could not be used to stereotype Mexican-American children in California since his findings pertained to the lower socioeconomic group.

School influences. Mageske (1967), examining the relationship between school factors and achievement, found that school facilities, curriculum, and staff exerted small influence, with teacher differences accounting for most of the difference, on educational achievement. The social composition of the student body was more highly related to achievement independent of the students themselves, and attitudes concerning control or responsiveness of environment were but slightly affected by school factors. He concluded that the student's own social background was more important than any school factor.

A profile given by Larson (1969) enumerated various characteristics of the low-income student pertaining to school. Larson found that the low-income student was less likely to report high grades in school course work and was reluctant to discuss educational and occupational plans with teachers. The low-income student was less interested in school and received less encouragement from teachers. Also, the low-income student was less likely to hold relatively large numbers of leadership positions in school organizations or belong to leading school groups. Wilson (1968) remarked that when the lower-class youngster can be persuaded to join in extracurricular

activities, he feels that he is making a contribution to the school, and experiencing this satisfaction he is less likely to drop out.

Language and cultural factors. Many researchers have emphasized the effects of language and cultural differences on educational achievement. Anderson and Johnson (1968), for instance, found that language is a factor in a child's educational aspirations. Scott (1969) stated that increased use of English in the home, besides increasing family income level, is associated with increased educational levels.

Forbes (1967), who studied Mexican-American children in the Southwest, attributed slowness in achievement to the fact that Anglo Americans imported the typical Anglo school into the Southwest so that bilingual schools were replaced by language-oriented schools. In many cases the Mexican American was excluded from the Anglo school. In parts of the Southwest (California and Texas), Mexican-American students attended segregated schools. Although after World War II segregated schools began to disappear and more Mexican Americans began to pursue higher education than ever before, dropout rates still remained high. Apparently this was the result of inability of Mexican Americans to relate completely to either the Anglo or Mexican culture, primarily because their parents were unable to transmit either culture effectively. Many public schools rejected the Mexican-American culture, substituting a "watered-down" Anglo culture and heritage. Confused Mexican-American young people

created a subculture of their own since they felt rejected by both cultures. Larger communities have entered a rapid cultural transition and the smaller communities are becoming dominantly Anglo. Fortunately, the advent of bilingual programs is giving the Mexican-American child the opportunity to bridge the gap between Anglo and Mexican cultures.

Self-concept. Self-concept or self-perception seems to be very important in educational achievement. Anderson and Johnson (1968) concluded that negative self-evaluation of ability to achieve in comparison with other children was deleterious to educational achievement. According to Larson (1969), low-income students tended to report lower or more negative self-evaluation of physical, social, academic, and emotional aspects than middle- or high-income students; thus, the educational achievement of the low-income group was impaired. As Gordon (1969) noted, to achieve, the student must be able to relate to himself as an effective being, the implication being that the student must have a positive self-concept. In a study of reading ability, White and Aaron (1966) showed quite definitely that the young reader needs to be shown the positive qualities cherished by Anglo society as exemplified in suitable reading material so that a positive identification can be made.

Predictive value of socioeconomic factors. It may be possible to predict academic performance by use of socioeconomic factors. For example, Jones (1968), in predicting academic performance with

the California Short Form Test of Mental Ability, found that there was a significant difference in social class means and a significant interaction of class means. Payne (1964) demonstrated that, by the end of the first grade, over one-half of the students who would fail arithmetic in the sixth grade could be identified on the basis of socioeconomic data besides intelligence scores and arithmetic tests. Payne also indicated that general learning, first in the home and community and later in the school, was clearly associated with socioeconomic factors.

Regional factors. Regional factors, pertaining to place of birth or residence, appear to exert influence on learning achievement. Scott (1969) found that family heads born in Texas attained a higher level of education than those born in Mexico. Regional citizenship was mentioned by Okada et al. (1969) as contributing to achievement in that Southern students did not measure up to their Northern counterparts. Leonard and Johnson (1967) found that rural farm workers lagged behind the national average in education, presumably due to socioeconomic factors associated with place of residence. Scott (1969) found differences between urban and rural Mexican Americans, with the urban group attaining higher educational levels than the rural group.

Practical skills. One socioeconomic factor rarely mentioned is that of practical skills. Children from low-income homes often attain ability in practical skills denied to children of affluent homes (Forbes, 1967). Many times the former are thus trained

long before children from high-income homes. This is the inevitable result associated with low income and large families. Older children must learn to take care of the younger ones and share the responsibilities of caring for the home. Thus, these children possess practical skills, especially in the lower paying occupations such as domestics and farm helpers, which are salable and are used to augment low incomes. These children may drop out of school "to help" financially and thus lose the opportunity to acquire more education that will eventually bring in more income than any occupation requiring little education.

Conclusion

After consideration of the effects of ethnicity and socio-economic status on educational achievement, one might well ask: How do we go about improving achievement? Ethnicity cannot be changed, but socioeconomic status can. The child must be motivated to remain in school and want to achieve. Gordon (1969) stated that the student's motivation to learn will be more easily tapped when the learning task leads to goals which he himself perceives as valuable. Content and form of learning experience must be suited to his cognitive style and temperamental characteristics and must complement his stage of cognitive development. This implies a sensitive determination of the curriculum to be presented, as well as the manner in which it is offered, and it must have social or utilitarian relevance. Curriculum must offer the opportunity to develop these skills and competencies which will expand the realm

of functional choice available to the child. If, as Wilson (1968) suggested, immediate curriculum changes tend to alleviate the conditions of poverty, then such changes must be made, not only for short-term benefits but for long-term benefits as well. Thus, eventually the conditions which contribute to low socioeconomic status will be changed and learning achievement will increase.

Chapter 3

METHODS

The purpose of this chapter is to describe the setting and the subjects of the study. The instrumentation used to gather data is described, and treatment of the data is outlined. An additional section describes subsequent disposition of the subjects.

Setting

The setting for the study was Hot Springs High School, Truth or Consequences, Sierra County, New Mexico, during the academic year 1970-71. Sierra County is a semi-rural area, with a population of 7,500, with a median age of 42 and an average income of $2,402 per year (University of New Mexico, Department of Economics, 1970). Twenty-one percent of the county's population have Spanish surnames.

Sources of income for county residents are farming, ranching, tourist services, retirement funds, and social service aid. No large industries or armed services facilities are present in the county, thus ensuring a stable population. Just previous to the time of the study, this stability had been temporarily interrupted by the presence of road crews building the Interstate Highway. However, by September 1970 the work had been completed and the crews had moved out with their families.

Truth or Consequences School District has two elementary schools, one middle school, and one high school. The four-year high school is attended by students from all areas of the county. Students travel distances ranging from six city blocks to 50 miles one way each day from homes to school. The school and county populations have remained fairly stable over the past 20 years. In 1948, the high school staff consisted of the principal, a secretary, and 18 teachers. At the time of the study, staff composition and number varied only by the addition of a guidance counselor to the personnel. It is evident that there has been no sudden spurt of growth or major change in the school district; thus, outside influences have contributed only negligible problems.

Subjects

The study sample consisted of ninth- and eleventh-grade students at Hot Springs High School who were enrolled full-time during the academic year 1970-71. The sample totaled 157 students, with 78 from the ninth grade and 79 from the eleventh grade. These two grades were selected primarily because they were given the Iowa Test of Educational Development (ITED) as part of regular school procedure and because they most nearly represented the population of Sierra County for homogeneity and ethnic grouping. An additional reason was based on the finding, according to the review of literature, that any educational gap between ethnic groups is wider and hence more apparent as groups progress through school.

Most of the students in each grade had been associated with each other, regardless of socioeconomic status or ethnic background, either since birth or from the first grade on up. Each grade, then, was highly homogeneous and cohesive. There were no definite areas or boundary lines to distinguish socioeconomic or ethnic groups.

Instrumentation

Two instruments were utilized in the study. The first was the Iowa Test of Educational Development (ITED), a standardized instrument consisting of nine tests designed to measure the student's general educational development (Appendix A). The ITED has undergone several revisions since its inception and is issued for two different school levels, one for elementary grades, the other for students in the ninth through the eleventh grades. Students are ranked upon a percentile basis comparative to the national testing of students in the same grades.

The second instrument used was the Hollingshead Two-Factor Index of Social Position (Appendix B). This instrument was developed to meet the need for an objective, easily applicable, easily scored means for estimating the position of an individual in the status structure of contemporary American society. Occupation and education of parents are the two factors used to determine socioeconomic status (SES). The two factors are weighted, and the assumption of a meaningful relationship between class position and education has been validated by factor analysis.

Procedures

The Iowa Test of Educational Development (ITED) was administered to the ninth and eleventh grades in October 1970. Since administration of the ITED to these two grades is a normal part of school procedure, the ninth-grade students were being tested for the first time and the eleventh-grade students for the second time. Any effects from familiarity with the ITED on eleventh-grade students were discounted as negligible because of the lapse of one year's time between administrations.

The Hollingshead Two-Factor Index of Social Position was used to determine the student's socioeconomic status on the basis of parental education and occupation. Records from the school's guidance office were used to obtain the necessary information. It was found that parental education ranged from third grade to post-college degree, and parental occupation from retired and welfare to professional. Upon completion of socioeconomic status determination, each student was classified, by parental socioeconomic status, as high or low. Possible scores on the index range from 11 to 77. In this study, 54 was selected as the cut-off point (the mean line) between low and high socioeconomic status.

Some difficulties were encountered because there is a definite relationship between occupational and economic status. Status of retired persons could be judged only from current incomes, not on the basis of income before retirement. Divorced parents presented a problem because of remarriage which could change income considerably.

Twenty-two students had parents in the divorced category. Five of the students were known to come from divorced homes with parental remarriage raising socioeconomic status level quite substantially.

In determining family socioeconomic status, it was noted that 25% of each class being tested were receiving either free or reduced-price lunches through the government hot-lunch program. When figured on a Mexican-American versus Anglo-American basis, the percentages of each ethnic group receiving hot-lunch aid did not differ much, by about only 9%. Percentages of Mexican-American and Anglo-American families of students receiving aid from the department of social services were almost identical.

Treatment of the Data

Before Iowa and socioeconomic status (SES) scores were tabled, the ethnic background of each student was determined by examining school records. The following code was used to designate ethnic groups: 1 for Anglo American, and 2 for Mexican American. For more convenient handling in the computer program, socioeconomic groups were also coded, as follows: 1 for high socioeconomic, and 2 for low socioeconomic.

Tables were prepared, listing each student by code number for ethnicity, code number (or score) for socioeconomic status, and ITED score, in preparation for analysis of variance to determine effects of ethnicity and SES and ethnicity by SES. In the event that no significant trends were found, it was decided that perhaps

trends could be detected by determination of means for each subgroup by ethnicity and socioeconomic status as to ITED scores.

Analysis of variance was conducted using a computer program written by Dr. Morris D. Finkner[1] and processed at New Mexico State University's Computer Center. F ratios were calculated and significant effects at the .05 level were noted. The following formula was used to determine F ratios:

$$F_{ab} = \frac{MS_{ab}}{MS_{wg}}$$

Subsequent Disposition of Students

Since October 1970, the eleventh-graders have graduated. Prior to graduation, eight of the 79 subjects dropped out of school due to moving, marriage, or other factors beyond the control of the school. Of the ninth-graders, nine dropped out with most of them moving to other communities.

Thirty-five of the original eleventh-graders have been admitted to institutions of higher learning with plans for continuing their education. This is slightly higher than the national average for high school graduates. Ten of the students planning to continue their education were Mexican American; this rate is also higher than the national average.

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[1]Dr. Morris D. Finkner, Director, University Statistics Center, Head of Department and Professor of Experimental Statistics, New Mexico State University, Las Cruces, New Mexico.

Since Sierra County is a low-income area, students expecting to attend college needed financial aid to varying degrees. This need was fulfilled by a total of 23 grants-in-aid from federal loans, state loans, or participation in work-study programs. One member of the class received an appointment to the U.S. Naval Academy, and one to the U.S. Merchant Marine Academy. The community also offered 15 scholarships ranging from $100 to $250 to supplement other financial aids. These scholarships were given by local civic and service organizations, such as the Sierra County Jaycees, Junior Women's Club, and others.

Chapter 4

RESULTS

In this chapter the problem and hypotheses are restated. Data pertinent to socioeconomic factors are presented for each grade, and adjusted means for each grade are also presented. Results of analyses of variance (based on primary data in Appendix C) are shown, followed by presentation of Iowa Test of Educational Development means to show trends.

The problem was to determine whether any significant differences of educational achievement, as measured by a standard test of academic performance, existed between groups and subgroups of varied ethnicity and socioeconomic status. The test used was the Iowa Test of Educational Development (ITED). The sample consisted of ninth- and eleventh-graders identified as Anglo American (coded as 1) and Mexican Americans (coded as 2) and classified as high socioeconomic (coded as 1) and low socioeconomic (coded as 2) status. From a possible score of 77 for socioeconomic status (SES), the mean line between high and low socioeconomic groups was 54.

Descriptions of Grades

Tables 1 and 2 contain socioeconomic data relevant to the ninth and eleventh grades, respectively. The ninth grade had 78 subjects; the eleventh grade had 79 subjects. Means were 46.88 and 51.48, with medians of 51 and 55, respectively, for each grade.

TABLE 1

Socioeconomic Factors for Ninth Grade

Item	Value
Sample Size	78
Maximum	77
Minimum	11
Range	66
Mean	46.88
Variance	311.42
Standard Deviation	17.64
Mean Deviation	14.00
Median	51
Mode	51

TABLE 2

Socioeconomic Factors for Eleventh Grade

Item	Value
Sample Size	79
Maximum	77
Minimum	11
Range	66
Mean	51.88
Variance	377.76
Standard Deviation	19.44
Mean Deviation	15.89
Median	55
Mode	73

Tables 3 and 4 show the adjusted means for the ninth and eleventh grades for the various ethnic and socioeconomic groups and their interactions. These tables are presented as descriptive samples. Groups considered were Anglo American (Ethnic Group 1), Mexican American (Ethnic Group 2), high socioeconomic (Socioeconomic Group 1), and low socioeconomic (Socioeconomic Group 2).

TABLE 3

Adjusted Means for Ninth Grade

Item	Value
Population Means	48.2
Ethnic Group 1	53.4
Ethnic Group 2	43.0
Socioeconomic Group 1	54.3
Socioeconomic Group 2	42.0
Ethnic Group 1 x Socioeconomic Group 1	58.2
Ethnic Group 1 x Socioeconomic Group 2	48.5
Ethnic Group 2 x Socioeconomic Group 1	50.5
Ethnic Group 2 x Socioeconomic Group 2	35.2

TABLE 4

Adjusted Means for Eleventh Grade

Item	Value
Population Means	43.0
Ethnic Group 1	53.6
Ethnic Group 2	32.6
Socioeconomic Group 1	44.7
Socioeconomic Group 2	41.5
Ethnic Group 1 x Socioeconomic Group 1	57.1
Ethnic Group 1 x Socioeconomic Group 2	50.0
Ethnic Group 2 x Socioeconomic Group 1	32.2
Ethnic Group 2 x Socioeconomic Group 2	33.0

Analyses of Variance

Hypothesis 1. There will be no significant difference in educational achievement, as measured by the ITED, between Anglo Americans and Mexican Americans within each grade level.

Analysis of variance for the ninth grade gave a computed F ratio of 2.52 for ethnicity (Table 5). Since this was not significant at the .05 level, this hypothesis for the ninth grade was not rejected. Analysis of variance for the eleventh grade gave a computed F ratio of 13.36, which was significant at the .05 level. This hypothesis for the eleventh grade was therefore not supported (Table 5).

Hypothesis 2. There will be no significant difference in educational achievement, as measured by the ITED, between high socioeconomic and low socioeconomic students within each grade level.

For the ninth grade, the computed F ratio was 3.57, which was not significant at the .05 level. This hypothesis for the ninth grade

TABLE 5

Analysis of Variance for Ninth and Eleventh Grades

Source of Variation	df	SS	MS	F ratio
Ninth grade				
Total	74	46400.66	627.03	
Reduction	3	6623.96	2207.98	
Ethnic Group	1	1412.81	1412.81	2.52 N.S.
Socioeconomic Group	1	2001.84	2001.84	3.57 N.S.
Ethnic Group x Socioeconomic Group	1	89.89	89.89	1.60 N.S.
Error	71	39776.69	560.23	
Eleventh grade				
Total	79	51299.95	649.36	
Reduction	3	8975.50	2991.83	
Ethnic Group	1	7438.72	7438.72	13.36*
Socioeconomic Group	1	173.27	173.27	1.84 N.S.
Ethnic Group x Socioeconomic Group	1	261.97	261.97	4.70 N.S.
Error	76	42324.44	556.90	

*Significant at the .05 level.

was therefore not rejected. Analysis of variance for the eleventh grade yielded an F ratio of 1.84, which was not significant at the .05 level (Table 5). This hypothesis in application to the eleventh grade was therefore not rejected.

Hypothesis 3. There will be no significant difference in educational achievement, as measured by the ITED, within each grade level by ethnicity and socioeconomic status for:

a. High socioeconomic Anglo Americans versus high socioeconomic Mexican Americans;
b. High socioeconomic Anglo Americans versus low socioeconomic Anglo Americans;
c. High socioeconomic Mexican Americans versus low socioeconomic Mexican Americans;
d. Low socioeconomic Anglo Americans versus low socioeconomic Mexican Americans;
e. Low socioeconomic Anglo Americans versus high socioeconomic Mexican Americans; and
f. High socioeconomic Anglo Americans versus low socioeconomic Mexican Americans.

Analysis of variance for significant differences between ethnic/socioeconomic groups within each grade level gave computed F ratios of 1.60 and 4.70 for the ninth and eleventh grades, respectively (Table 5). No significant differences were found; therefore, this hypothesis was not rejected for either grade. Since no significant differences were found for the interaction of ethnicity and socioeconomic status, computations were not carried further.

Since the only significant difference found was for ethnicity at the eleventh grade level, the question arose as to whether it was possible at least to show ethnic/socioeconomic trends. Therefore,

the means for ITED scores for each ethnic group by socioeconomic level were calculated for each grade (Table 6). This enabled comparisons to be made. It may be seen that the high Anglo-American groups had almost identical ITED means, 58 and 57, for the ninth and eleventh grades, respectively. Means for the high Mexican-Americans groups were 48 and 32 for the ninth and eleventh grades, respectively. Low Anglo-American group means were 50 for both grades, and low Mexican-American group means were 35 and 33 for the ninth and eleventh grades, respectively.

TABLE 6

Trends for Ninth and Eleventh Grades

Grade	Group	ITED mean
Ninth	High Anglo Americans	58
	Low Anglo Americans	50
	High Mexican Americans	48
	Low Mexican Americans	35
Eleventh	High Anglo Americans	57
	Low Anglo Americans	50
	Low Mexican Americans	33
	High Mexican Americans	32

As shown by Table 6, the tendency was for both Anglo-American groups to score above the Mexican-American groups in both grades. Between grades, the high Anglo-American group for the ninth grade scored one point above the corresponding group of eleventh-grade students. Scores for both low Anglo-American groups in each grade were identical. The ninth-grade high Mexican-American group

scored 16 points above the eleventh-grade high Mexican-American group, and the low Mexican-American group in the ninth grade scored two points above the corresponding group of Mexican-American students in the eleventh grade. Examination of the whole table shows that the Anglo-American groups scored above the Mexican-American groups in both high and low socioeconomic groups. Hierarchy of ranking was: for the ninth grade, high Anglo Americans, low Anglo Americans, high Mexican Americans, and low Mexican Americans; for the eleventh grade, high Anglo Americans, low Anglo Americans, low Mexican Americans, and high Mexican Americans.

Discussion

According to the analyses of variance, a significant difference in educational achievement for ethnicity was found at the eleventh-grade level only. Why this occurred at this grade level and not earlier remains undetermined. However, this finding seems to support the theory advanced by Coleman (1966) and Grebler (1967) and others that the educational gap between Anglo Americans and Mexican Americans widens as students progress in grade level.

A lack of significant differences within the ninth grade on the basis of ethnicity and lack of significant differences within both grades as to socioeconomic status could possibly be attributed to the fact that the subjects represented a population that was neither all rural nor all urban. Additionally, no distinct ethnic barriers existed as to neighborhood, and similarly no distinction between social classes apparently existed. Furthermore, most of

the students had been associated with each other since preschool days or the first grade and throughout most of their schooling. Differences of class and ethnicity had evidently been smoothed over through years of familiarity. This process had apparently been enhanced by the fact that only two elementary schools and one middle school contributed students to the high school. The cohesiveness of the students carried over from the lower grades into high school. It was not until the eleventh grade (or possibly the intervening tenth grade, which was not studied) that ethnic effects were noticeable. Perhaps in the last two years of high school, class cohesiveness was beginning to break down as students approached graduation and separation. Also, perhaps exposure to mass media and the emphasis placed upon the Mexican American as possessing a different heritage and culture from the Anglo American was beginning to take effect. The feeling for ethnic differences may have begun to come to a culmination.

The trends noted in Table 6 show that Anglo Americans outranked Mexican Americans in both grades as to ITED means. This is in agreement with research also that has found that Anglo Americans outperform Mexican Americans (Coleman, 1966; Grebler, 1967). Hierarchy of ranking in each grade has been discussed. However, the difference in ITED means between ninth-grade high Anglo Americans and high Mexican Americans was only 10, whereas for the eleventh grade the difference between these groups increased to 25, more than twice the ninth-grade difference. This increase, while it may support

the theory of the widening educational gap, does not support any idea that the Mexican American shows more achievement with increase in grade level due to selectivity and retention, especially since the high Mexican Americans lost 16 points between grades. This suggests that the high Mexican Americans were still dropout prone, whereas the low Mexican American group, having lost only two points between grades, apparently planned to remain in school.

Anglo American groups showed less variation in differences. In the ninth grade, the high group scored 8 points above the low group and 7 points above the low group in the eleventh grade. The high group lost one point between grades, but the low group scored 50 in each grade. Seemingly, both high and low groups intended to remain in school.

Ninth-grade low Anglo Americans and high Mexican Americans scored only two points apart; however, eleventh-grade scores varied by 18 points. This suggests that ninth-grade cohesiveness was still strong, but that by the eleventh grade ethnic/socioeconomic distinctions were becoming more apparent. Also, in the ninth grade, high Mexican Americans scored 13 points above the low Mexican Americans, but eleventh-grade low Mexican Americans scored one point above the high group, a possible indication that the Mexican Americans were drawing together as an ethnic group.

There is a slight possibility that the arbitrary use of 54 as the cut-off point on the socioeconomic scale to determine high and low socioeconomic status influenced the outcome of the study due to the small number of students.

Chapter 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study attempted to determine whether any significant differences of educational achievement, as measured by a standard test of academic performance, existed between groups and subgroups of varied ethnicity and socioeconomic status within two high school grade levels, the ninth and eleventh.

The study was conducted at Hot Springs High School, Truth or Consequences School District, Sierra County, New Mexico, during the academic year 1970-71. All ninth- and eleventh-grade students who were enrolled full-time that year were utilized as subjects. The ninth grade had 78 students, and the eleventh grade had 79 subjects. Ethnicity was determined by examination of student records; those students with Spanish surnames were classified as Mexican Americans (coded 2) and all others were classified as Anglo Americans (coded 1). The Hollingshead Two-Factor Index of Social Position was used to determine the socioeconomic status of each student. High socioeconomic students were coded 1, and low socioeconomic students were coded 2, with the mean line at 54 on the scale of 11 through 77 points. The Iowa Test of Educational Development was used to measure educational performance.

The following three hypotheses were formulated and tested by analysis of variance for each grade:

1. There will be no significant difference in educational achievement, as measured by the Iowa Test of Educational Development (ITED), between Anglo Americans and Mexican Americans within each grade level.

2. There will be no significant difference in educational achievement, as measured by the ITED, between high socioeconomic and low socioeconomic students within each grade level.

3. There will be no significant difference in educational achievement, as measured by the ITED, within each grade level by ethnicity and socioeconomic status for:
   a. High socioeconomic Anglo Americans versus high socioeconomic Mexican Americans;
   b. High socioeconomic Anglo Americans versus low socioeconomic Anglo Americans;
   c. High socioeconomic Mexican Americans versus low socioeconomic Mexican Americans;
   d. Low socioeconomic Anglo Americans versus low socioeconomic Mexican Americans;
   e. Low socioeconomic Anglo Americans versus high socioeconomic Mexican Americans; and
   f. High socioeconomic Anglo Americans versus low socioeconomic Mexican Americans.

Each hypothesis was tested by analysis of variance for each grade. Only one factor, the main effect of ethnicity, yielded a significantly different F ratio. This was for the eleventh grade, and the difference was significant at the .05 level. Calculation of means for ITED scores for each ethnic/socioeconomic group within each grade revealed an almost identical similarity of performance by rank within each grade: high Anglo Americans, low Anglo Americans, high Mexican Americans, low Mexican Americans, for the ninth grade; high Anglo Americans, low Anglo Americans, low Mexican Americans, high Mexican Americans, for the eleventh grade. None of the mean scores for any groups increased from grade to grade;

all scores decreased, with the exception of the mean score for the low Anglo Americans which was the same within both grades.

Conclusions

Since the only significant difference was that found for ethnicity at the eleventh-grade level, only hypothesis 1 was rejected for that grade. It was concluded that, in this study and subject to the limitations detailed in Chapter 1, only ethnicity had a significant effect on educational achievement. Calculation and comparison of mean ITED scores indicated that the difference lay between Anglo Americans and Mexican Americans of high socio-economic status.

In view of the importance attached to effects of socioeconomic status on educational achievement by various researchers, it was concluded that perhaps the study was at fault in not examining a larger, more diverse population or that the difficulty lay in the need for an experimental study in which control groups could be used. A study based on socioeconomic factors alone, with disregard for ethnicity, might show different results.

Further conclusions may be stated on the basis of data not considered in the analyses of variance or ITED mean scores. This refers to subsequent disposition of the students. Unfortunately, sufficient information was not available to compile statistics. However, information presented in Chapter 3 showed that nine of the 78 ninth-graders subsequently dropped out of school, primarily because their families moved to other communities. For the 79

subjects in the eleventh grade, eight dropped out before graduation, so that the total graduating class consisted of 71 students. At the time this study was being written, it was known that 35 eleventh-graders were attending institutions of higher learning, representing a percentage of almost 50%. Of these, 10 were Mexican American, or approximately 21%, of the college-attending students, or 14% of the graduating class of 71. It is not known how many attained a bachelor's degree or planned to go on to higher degrees.

Also in Chapter 3 it was noted that many of the students attending college needed and received financial assistance from various sources, such as federal and state loans, work-study programs, and scholarships offered by different civic organizations. It may therefore be concluded that many of the students who did attend college anticipated and were helped to resolve financial problems.

In general, the ultimate aim of the study, to identify socio-economic factors that could be changed or alleviated by revision of existing curricula, was not achieved. However, lack of statistical backing does not preclude the possibility of identifying these factors and effecting changes. Observation, student achievement, student ratings and polls could very well provide basic substitutes. Also, it must be remembered that the population studied was apparently far more cohesive and homogeneous than is usually expected.

Recommendations

According to the limitations stated in Chapter 1, this study should not be generalized to the total high school population of

New Mexico. Since the study sample was relatively small and very cohesive in a semi-rural area, the following recommendations seem pertinent:

1. The study should be replicated but expanded to include several small school districts or one large school district or both. The region covered should include both urban and rural areas to remove the effects of association of various socioeconomic/ethnic groups outside the school setting.

2. While awaiting confirmation or refutation of this study's results, interested schools should assess their goals and procedures and attempt to make immediately any possible curricular changes that are seen to affect the motivation and retention of low socioeconomic students, particularly Mexican Americans.

3. After curricular changes, if any, have been made, follow-up studies should be made to ascertain whether low socioeconomic groups who remained in high school until graduation have been able to advance their socioeconomic levels, to what degree these changes have been made, and to what specific factors these changes in socioeconomic levels may be attributed. These follow-up studies should include questions as to individual perceptions of school programs and specific course work. When it is known what school factors are the most influential in motivating low socioeconomic students to learn and remain in school, these factors may be emphasized or reevaluated for curriculum revision on a long-term basis.

Besides parental occupation and education, there are many diverse socioeconomic factors. These are important but are sometimes neglected. These aspects, such as student self-concept, should be evaluated to determine as precisely as possible just what influence, favorable or unfavorable, each exerts on educational achievement in the specific school setting. Possible means of eliminating, alleviating, or changing these factors to improve academic performance can then be sought, utilized, and assessed. When factors outside the school's sphere are identified, referrals, where practicable, to specific local, state, or federal sources of aid may prove helpful.

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APPENDIX A

HOLLINGSHEAD TWO-FACTOR INDEX OF SOCIAL POSITION

THE HOLLINGSHEAD TWO-FACTOR INDEX OF SOCIAL POSITION

I. The Scale Scores:

To determine the social position of an individual or of a household, two items are essential: (1) the precise occupational role the head of the household plays in the economy; and (2) the amount of formal schooling the head of the household has received. Each of these factors is then scaled according to a specific system.

A. The Occupational Scale:

1. Higher executives, proprietors of large concerns, and major professionals.

2. Business managers, proprietors of medium-sized businesses, and lesser professionals.

3. Administrative personnel, small independent business owners, and minor professionals.

4. Clerical and sales workers, technicians, and owners of little businesses.

5. Skilled manual employees.

6. Machine operators and semi-skilled employees.

7. Unskilled employees.

The occupational scale is based on the assumption that occupations have different values attached to them by the members of our society. The hierarchy ranges from the low evaluation of unskilled physical labor to the more prestigious skills through the creative talents of persons with ideas and those who manipulate men. The ranking of occupational functions implies that some men exercise

control over the occupational pursuits of other men. Normally, a person who possesses highly trained skills has control over several other people. This is exemplified in a highly developed form by an executive in a large business enterprise who may be responsible for decisions affecting thousands of employees.

B. The Educational Scale:

The educational scale is based upon the assumption that men and women who possess similar education will tend to have similar tastes and attitudes, and that they will also tend to exhibit similar behavioral patterns. The educational scale is divided into seven positions:

1. Graduate professional training (persons who have completed a recognized professional course leading to a graduate degree).

2. Standard college or university training leading to a degree (all graduates of a four-year college of university, state or private).

3. Partial college training (persons who have completed at least one year but not a full college course, including one to three years attendance).

4. High school graduates (all secondary school graduates, from a private preparatory school, public high school, trade school, or a parochial high school).

5. Partial high school (individuals completing the tenth or eleventh grades but not graduates).

6. Junior high school (individuals completing the seventh through the ninth grades).

7. Less than seven years of school (individuals not completing the seventh grade).

II. Integration of the Two Factors:

The factors of occupation and education are combined by weighting the individual scores obtained from the scale positions. Weights for each factor were determined by multiple correlation techniques. The weight for each factor is:

Occupation	7
Education	4

To calculate the Index of Social Position score for an individual, the scale value for occupation is multiplied by the factor weight for education. For example, John Smith is the manager of a chain supermarket. He completed high school and one year of business college. His Index of Social Position score is computed as follows:

Factor	Scale Score	Factor Weight	Score x Weight
Occupation	3	7	21
Education	3	4	12
	Index of Social Position Score		33

III. Index of Social Position Scores:

The Two-Factor Index of Social Position scores may be arranged on a continuum, or they may be divided into groups. The range of scores on a continuum is from a low of 11 to a high of 77. For some purposes a researcher may work with a continuum; for other purposes he may desire to break the continuum into a hierarchy of score groups.

APPENDIX B

IOWA TEST OF EDUCATIONAL DEVELOPMENT

THE IOWA TEST OF EDUCATIONAL DEVELOPMENT

The Iowa Test of Educational Development (ITED) is a battery of nine objective tests designed to provide a comprehensive and dependable description of the general educational development of the student, specifically to:

1. Measure the pupil's knowledge and understanding of contemporary social institutions and practices, including items based on fundamental social "concepts," such as democracy, taxation, labor, immigration, and the industrial revolution.

2. Measure the pupil's general understanding of scientific terms and principles of common phenomena and industrial applications.

3. Indicate the student's mastery of some of the basic elements in correct and effective writings, punctuation, usage, capitalization, spelling, diction, phraseology, and organization.

4. Measure abilities developed in conjunction with work in all areas of elementary and secondary curriculum.

5. Indicate the student's ability to interpret and evaluate representative reading selections from social studies, magazines and newspapers, and social studies materials in general.

6. Indicate the student's ability to interpret textbooks, references, and scientific articles in newspapers and periodicals; to estimate the student's ability to perform actual experiments and report experimental data.

7. Measure the student's understanding of literary materials.

8. Estimate the student's general vocabulary in an attempt to assess the special type of intelligence needed for success in school work.

9. Evaluate the student's ability to turn to the source of information which is most likely to contain the solution to a particular problem.

APPENDIX C

ETHNIC ORIGIN, SES, AND ITED SCORES

TABLE 7

Ethnic Origin, SES, and ITED Scores for Ninth-Grade Students

Ethnic origin[a]	SES	ITED score	Ethnic origin	SES	ITED score
2	58	18	1	55	61
2	51	7	2	73	35
1	75	23	2	41	72
1	44	55	2	73	35
2	70	13	2	51	81
2	73	55	1	30	48
1	55	77	1	22	95
2	75	23	1	47	55
1	18	77	1	51	48
1	50	81	1	58	77
2	58	55	1	29	42
1	44	13	1	18	81
2	23	13	2	73	61
1	65	48	1	40	55
1	65	48	1	18	61
1	51	55	1	55	35
1	15	50	1	51	35
1	55	18	1	55	48
1	37	61	1	18	77
2	70	35	1	75	23
2	66	93	1	44	35
1	18	67	2	65	25
2	62	18	1	22	88
1	55	42	1	51	42
2	73	29	1	62	67
2	73	35	2	10	65
1	11	88	1	69	72
1	19	55	1	18	95
1	48	91	1	15	13
2	77	29	2	77	23
1	18	61	2	40	35
1	44	55	1	29	72
1	58	77	2	62	18
1	51	29	1	73	5
2	58	77	1	77	42
2	58	77	2	70	67
2	70	18	1	75	23
2	73	35	1	70	88
2	73	61			

[a]Code for Anglo American is 1; for Mexican American, 2.

TABLE 8

Ethnic Origin, SES, and ITED Scores for Eleventh-Grade Students

Ethnic origin[a]	SES	ITED score	Ethnic origin	SES	ITED score
1	53	94	1	18	44
2	51	32	1	37	44
2	51	44	1	11	83
2	69	24	2	44	18
2	56	32	2	44	66
1	11	40	1	44	27
1	51	38	1	69	6
2	75	8	1	51	95
1	66	55	2	44	32
2	70	55	1	48	44
1	52	38	2	63	18
1	18	90	1	18	66
2	18	27	1	69	27
1	37	66	1	62	50
1	69	18	1	51	90
1	18	85	1	30	44
2	70	66	1	48	71
1	44	66	1	22	32
1	18	80	1	22	60
1	30	27	1	58	32
2	44	27	2	41	11
2	44	8	1	71	55
1	37	87	1	51	38
2	69	27	1	65	60
1	62	60	2	44	27
1	62	38	1	70	27
1	37	22	1	37	60
2	77	27	2	51	14
1	15	94	2	51	27
1	49	76	1	69	14
1	51	66	1	11	50
1	51	71	1	51	40
2	55	22	1	66	18
1	62	22	1	77	25
1	55	71	1	58	32
1	15	80	1	45	11
1	44	22	1	55	14
1	37	96	1	69	76
1	51	80	1	18	66
1	37	71	1	77	60
1	69	80			

[a]Code for Anglo American is 1; for Mexican American, 2.